

**DAY 5 - Binomial Factoring – Difference of Squares**

Which expressions are differences of squares? Provide reasons for your decision. 2.

a)  $x^2 - 9$

b)  $49 + x^2$

c)  $100 - 36x^2$

3  
 ✓  
 - 2 terms  
 - one neg  
 - can ✓

X  
 no neg

✓

Factor  $2x^2 - 18$ . Is it a difference of squares? Why or why not? Is it possible to factor this binomial? Explain your answer.

Yes if do GCF 1st then it becomes diff. of sq.

$2 \left( \frac{2x^2}{2} - \frac{18}{2} \right)$

$= 2(x^2 - 9)$   
 x x -3 -3

$= 2(x+3)(x-3)$

3

3. Factor the ones that can be factored in #1. Then check your answers by expanding.

a)  $(x+3)(x-3)$

c)  $100 - 36x^2$

check

$x^2 + 3x - 3x - 9$

$x^2 - 9$  ✓

$(10+6x)(10-6x)$

check

$100 - 60x + 60x - 36x^2$

$100 - 36x^2$  ✓

Factor completely

4.  $x^2 - 81$

$x^2 + 0x - 81$

x x 9 -9

$(x+9)(x-9)$

7.  $400 - x^2$

$(20+x)(20-x)$

5.  $x^2 - 121$

$(x+11)(x-11)$

6.  $x^2 - 144$

$(x+12)(x-12)$

10.  $100 - x^2$

$(10+x)(10-x)$

11.  $225 - x^2$

$(15+x)(15-x)$

12.  $16x^2 - 121$

$(4x+11)(4x-11)$

13.  $2 \left( \frac{8x^2}{2} - \frac{18}{2} \right)$

$= 2(4x^2 - 9)$

$= 2(2x+3)(2x-3)$

14.  $3 \left( \frac{48x^2}{3} - \frac{27}{3} \right)$

$= 3(16x^2 - 9)$

$= 3(4x+3)(4x-3)$

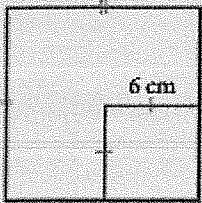
15.  $5 \left( \frac{5x^2}{5} - \frac{45y^2}{5} \right)$

$= 5(x^2 - 9y^2)$

$= 5(x+3y)(x-3y)$

16.

A square has area  $x^2$  square centimetres. At one corner, a smaller square with sides 6 cm long has been removed.



- a) Write the binomial to represent the difference between the two areas.
- b) Factor the binomial to find expressions for the dimensions of a rectangle with area equal to the remaining area of the large square.
- c) Find the actual dimensions of this rectangle if  $x = 10$  cm.

a)  $x^2 - 6^2$   
 $= x^2 - 36$

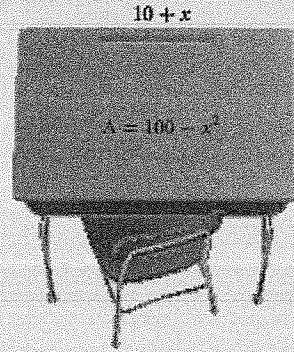
b)  $(x+6)(x-6)$   $\therefore L = x+6$   
 $W = x-6$

c)  $L = 10+6 = 16\text{cm}$   $W = x-6 = 10-6 = 4\text{cm}$

17.

The area of the top of a classroom art table shown is represented by the expression  $100 - x^2$ .

- a) If the length is represented by  $10 + x$ , find the expression to represent its width.
- b) Find the actual dimensions if  $x = 4$  ft.
- c) Calculate the area.



a)  $A = 100 - x^2$   
 $= (10+x)(10-x)$   
 $\therefore W = 10 - x$

b)  $L = 10 + x$   
 $= 10 + 4$   
 $= 14 \text{ ft}$

$W = 10 - x$   
 $= 10 - 4$   
 $= 6 \text{ ft}$

c)  $A = LW$   
 $= 14(6)$   
 $= 84 \text{ ft}^2$

18. Expand

a.  $-2(3a+5)(a-2)$

$= -2(3a^2 - 6a + 5a - 10)$   
 $= -2(3a^2 - a - 10)$   
 $= -6a^2 + 2a + 20$

b.  $2b(b-1)^2$

$= 2b(b-1)(b-1)$   
 $= 2b(b^2 - 1b - 1b + 1)$   
 $= 2b(b^2 - 2b + 1)$   
 $= 2b^3 - 4b^2 + 2b$

19. Factor - mix of types

a.  $y^2 + 15y + 56$

$\begin{matrix} y & 1 & 2 & 4 & 7 \\ y & 56 & 28 & 14 & 8 \end{matrix}$

$(y+7)(y+8)$

b.  $36x^2 - y^2$

$\begin{matrix} 6x & -y \\ 6x & y \end{matrix}$

$(6x+y)(6x-y)$

c.  $\frac{17ac - 34ad}{17a}$

$= 17a(c - 2d)$

d.  $\frac{3g^2 + 6g + 9}{3}$

$= 3(g^2 + 2g + 3)$   
 $\begin{matrix} g & 3 \\ g & 1 \end{matrix}$   
 can't do more